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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/401,660

09/23/1999

MASAAKI NAKABAYASHI

684.2902

4966

5514

7590

10/08/2002

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EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 10/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/401,660

Applicant(s)

NAKABAYASHI ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 20, 2002 has been entered.
2. This Office Action is also in response to applicant's amendment filed on August 20, 2002 which has been entered as paper number 21.
3. By this amendment, the applicant has amended claims 1-11 and 13-14 and has canceled claims 15-20.
4. Claims 1-14 remain pending in this application.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. *Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imamura et al (PN. 5,847,877) in view of the patent issued to Harris et al (PN. 5,208,700).*

Imamura et al teaches a diffractive optical element having a plurality of grating surface structures (21 and/or 22), *serve as the first and the second diffraction grating*, that are formed at interfaces of different materials, *serve as the first and the second substrates*, having different refractive indices and different dispersions wherein the substrates (11 and 13 Figure 14)) are accumulated with a space (layer

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12) there between, (please see Figures 11-15). Imamura et al teaches that the depth of the grating structure may be set to equal the value that is enabling the optical element to obtain 100 percent diffraction efficiency for an m_0 order for a selected wavelength range, (please see columns 4 and 7 and Figures 10 and 19), and when such depth is set for the grating structures the maximum optical path length difference is equal to an integer multiple for each of the associated selected wavelength range.

Claims 1-4, 7-8 and 11 have been *amended* to recite that the space is an *air space*. Imamura et al does not teach explicitly that the space (layer 12) is an air space. However Imamura et al does teach explicitly about the condition required between the *refractive indices* of the adjacent optical layers, with a relief diffraction grating formed at the interface of the two adjacent layers, to eliminate the wavelength dependence of the diffraction grating. It would therefore have been obvious to one skilled in the art to select air (with refractive index 1 which is a known optical medium in the art) as a layer material to design the diffractive optical element to obtain desired diffraction efficiency. Since it has been held to be within the general skill of a worker in the art to *select a known material* on the basis of its *suitability* for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

This reference has met all the limitations of the claims with the exception that it fails to teach to include alignment patterns formed with the grating structures on the substrates for alignment purpose. However to use alignment markings formed on the optical elements in order to engage the optical elements in good alignment is rather a well known practice in the art as taught by the teachings of Harris et al. Harris et al teaches that the alignment markings may be formed on the surface of the substrate for a grating lens (14) and on the surface of the substrate for a lens cover (16) such that the corresponding recess of the alignment markings may be engaged and aligned in order to make the grating lens in good alignment with the lens cover, (please see column 3 lines 65 to column 4 lines 5). It would then have been obvious to one having ordinary skill in the art to apply the teachings of Harris et al to modify the

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diffractive optical element of Imamura et al to form alignment markings on the plurality of grating surface structures for the benefit of providing a better alignment.

With regard to claim 5, although Imamura et al does not teach explicitly that the grating structures are opposed to each other however this modification is considered to be an obvious matter of design choice to one skilled in the art for the purpose of obtain a diffractive optical element with desired characteristics.

With regard to claims 6-8 although this reference (Harris et al) does not teach explicitly that the alignment markings are of the cited geometric shapes. However such modification is considered to be obvious matter of design choices to one having ordinary skill in the art since as long as the alignment markings are capable of engaging to each other to assure the alignment the shapes have no criticality.

With regard to claims 10-11, Imamura et al does not teach explicitly to use a *mold* for making the diffraction gratings for the diffractive optical element. However using molding process for making diffraction grating is pretty standard in the art as demonstrated by the teachings of Harris et al. Harris et al teaches that the diffractive optical element may be formed by pressing a mold having negative of the diffractive optical element pattern into a flat soft coating on a hard substrate, (please see column 4). It would then have been obvious to one skilled in the art to apply the teachings of Harris et al to actually manufacture the diffractive optical element of Imamura et al. Although this reference (Harris et al) teaches that the alignment marks are made by photolithographic process. However it would have been obvious matters of design choice to one skilled in the art to make the alignment marks also with molding process since both lithographic process and molding process are conventional process for making grooves, marks or grating on a recording medium and it would be more economical to make both the diffractive optical element and the alignment markings with the same molding process. Furthermore, it would also have been an obvious modification to one skilled in the art to make the alignment markings

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fitted to each other during the molding process for the benefit of achieve good alignment during the molding process.

With regard to claims 13 and 14, Imamura et al teaches that the diffractive optical element may have the function of a lens, which is an optical system.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-14 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 of copending *Application No. 09/871,630*.

Although the conflicting claims are not identical, they are not patentably distinct from each other because they both recite a diffractive optical element having two layers of diffraction gratings and alignment markings on each of the layers to align the two gratings.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

9. Claims 1-14 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 and 13-15 of copending *Application No. 09/411,632*. Although the conflicting claims are not identical, they are not patentably distinct from each

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other because they both recite a diffractive optical element having two layers of diffraction gratings and alignment markings on each of the layers to align the two gratings.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

10. Applicant's arguments filed on August 20, 2002 have been fully considered but they are not persuasive. The amended claims have been fully considered and they are rejected for the reasons stated above.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

A. Chang, Ph.D.
September 26, 2002

Audrey Y. Chang
Primary Examiner
Art Unit 2872

